(12) **United States Patent**
Zhuge et al.

(10) **Patent No.:** **US 9,462,083 B1**
(45) **Date of Patent:** **Oct. 4, 2016**

(54) **SERVER SIDE MATCHING OF OFFSITE CONTENT VIEWING TO ONSITE WEB ANALYTICS DATA**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 630 days.

(21) Appl. No.: **13/833,459**

(22) Filed: **Mar. 15, 2013**

(51) **Int. Cl.**
     H04L 29/06 (2006.01)
(52) **U.S. Cl.**
     CPC **H04L 67/42** (2013.01)
(58) **Field of Classification Search**
     CPC .. G06Q 30/02; G06Q 30/0255; G06Q 30/00;
            H04L 67/02; H04L 67/20; G06F 17/30;
                           G06F 7/06; G07G 1/14
     See application file for complete search history.

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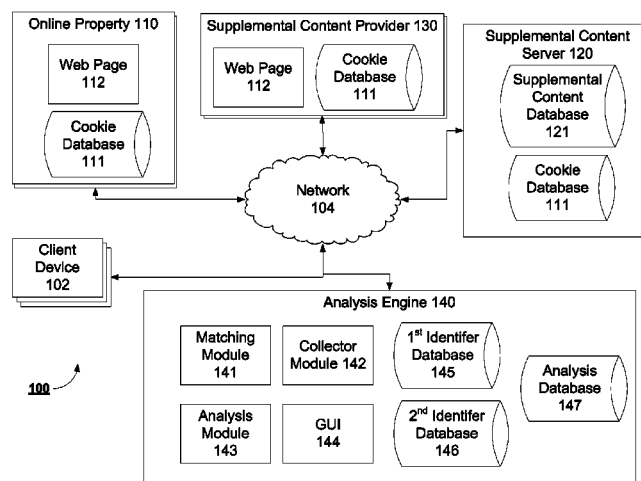*Primary Examiner* — Ario Etienne
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(57) **ABSTRACT**

The present disclosure is directed generally to systems and methods for the server side matching of web analytics and content viewing. According to the methods and systems disclosed herein, a first identifier is delivered to a client device when the client device accesses a first website. If the client device later accesses of a second website the first identifier can be processed by the system to determine if the client device previously accessed the first website.
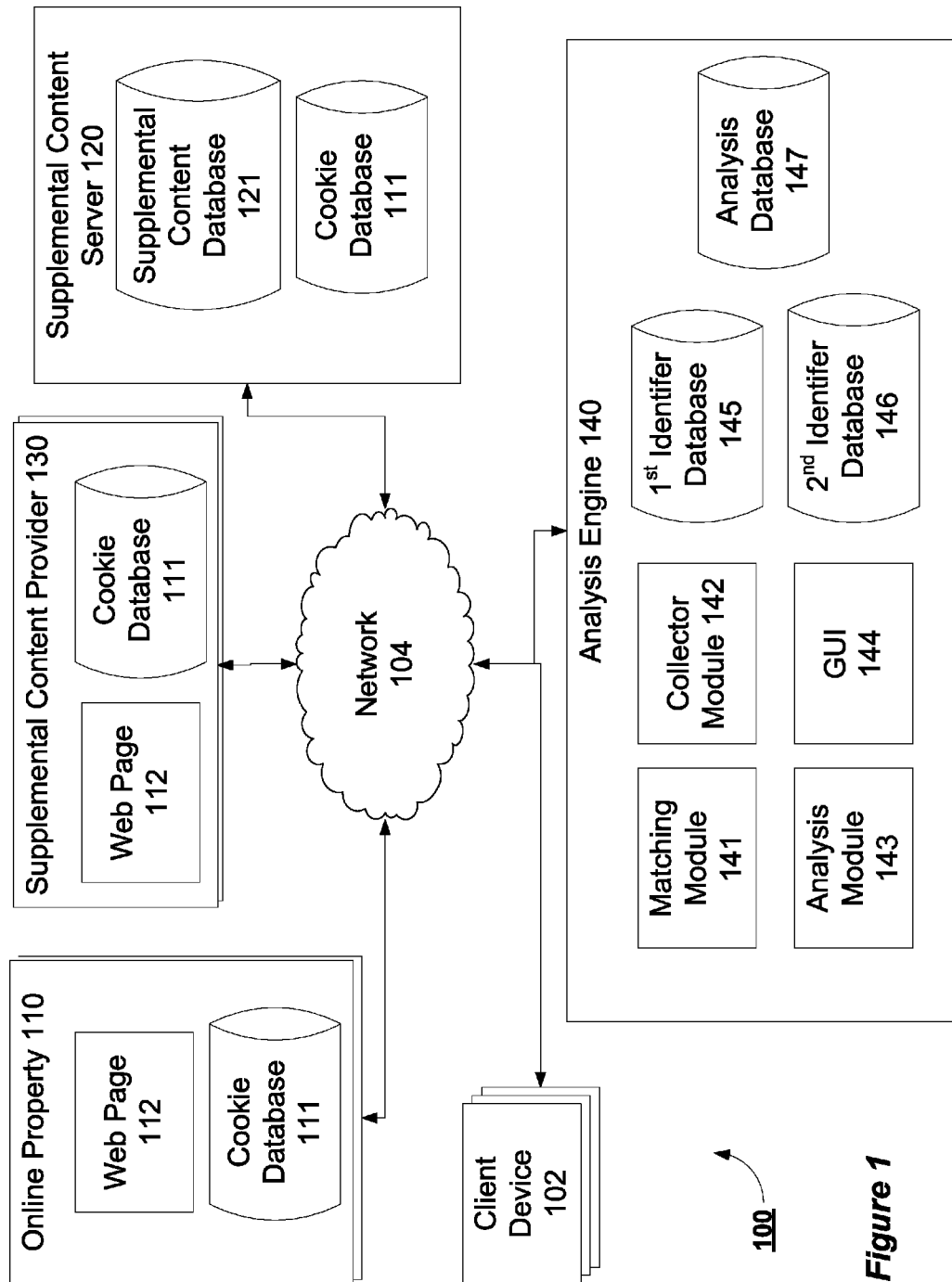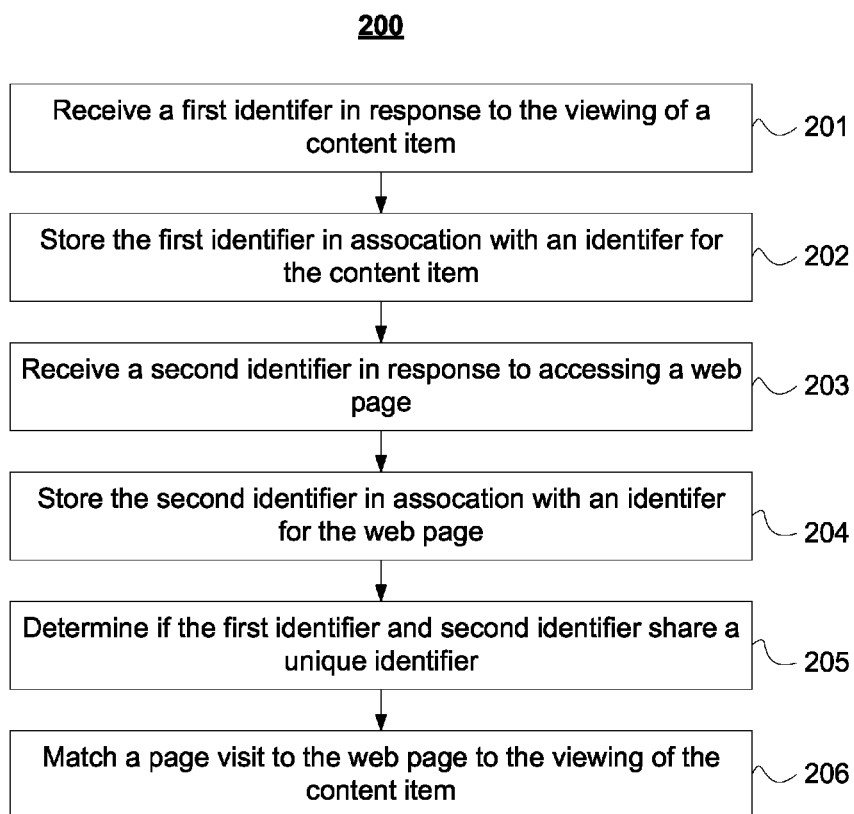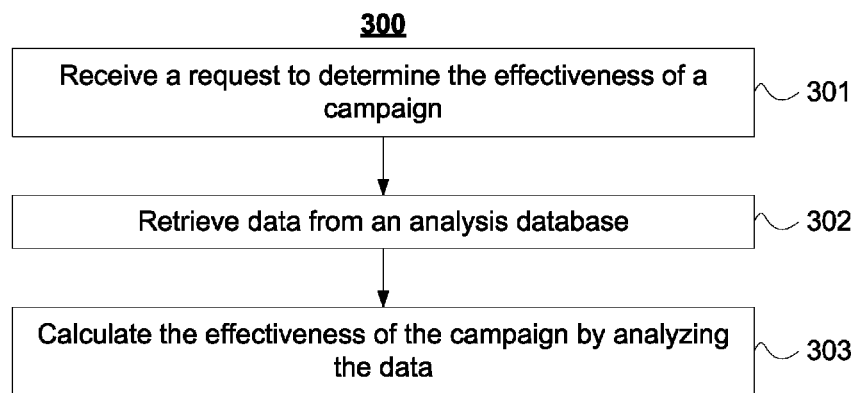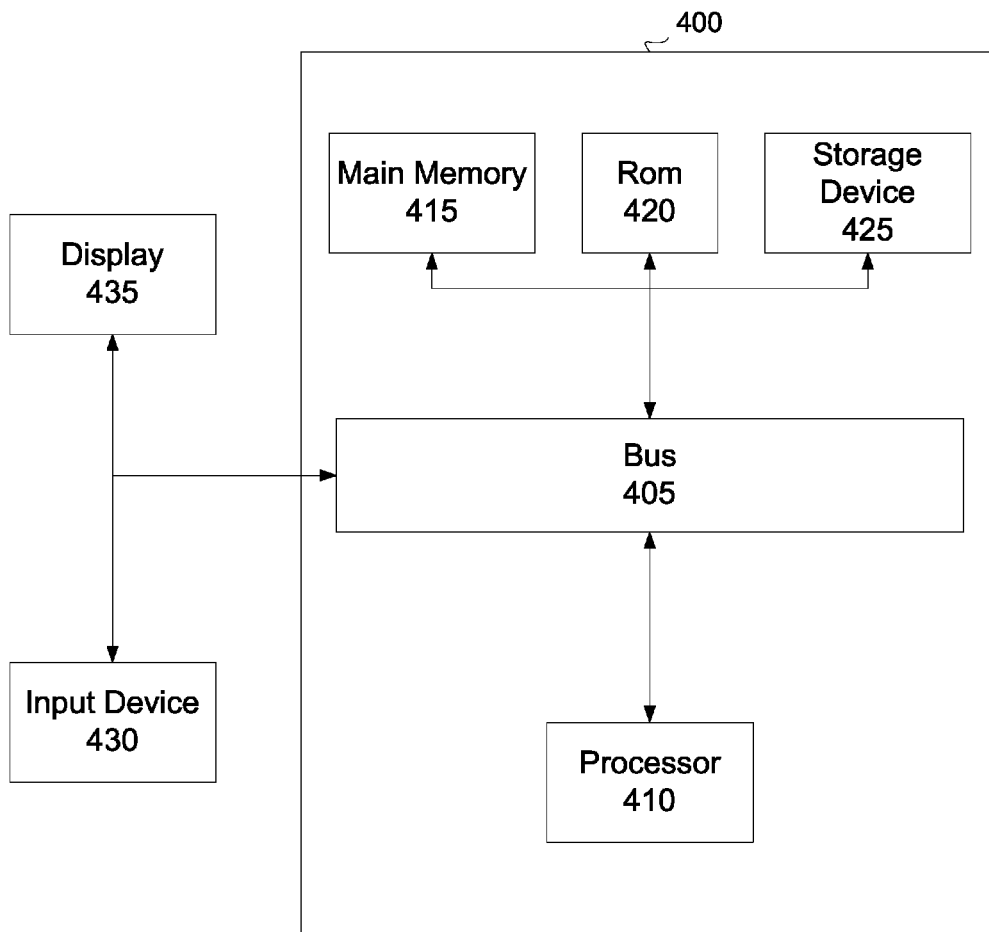
19 Claims, 4 Drawing Sheets

Figure 1

<u>200</u>

```
┌─────────────────────────────────────────────┐
│ Receive a first identifer in response to the │      201
│         viewing of a content item            │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ Store the first identifier in assocation with│      202
│     an identifer for the content item        │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ Receive a second identifier in response to   │      203
│          accessing a web page                │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ Store the second identifier in assocation    │      204
│     with an identifer for the web page       │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ Determine if the first identifier and second │      205
│    identifier share a unique identifier      │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│ Match a page visit to the web page to the    │      206
│         viewing of the content item          │
└─────────────────────────────────────────────┘
```

Figure 2

300

| Receive a request to determine the effectiveness of a campaign | 301 |

↓

| Retrieve data from an analysis database | 302 |

↓

| Calculate the effectiveness of the campaign by analyzing the data | 303 |

Figure 3

400

| Display 435 |
| Input Device 430 |

| Main Memory 415 | Rom 420 | Storage Device 425 |

Bus 405

Processor 410

Figure 4

SERVER SIDE MATCHING OF OFFSITE CONTENT VIEWING TO ONSITE WEB ANALYTICS DATA

BACKGROUND OF THE DISCLOSURE

Websites often include analytics engines that monitor site traffic. Additionally, supplemental content it often displayed on websites. The supplemental content can direct traffic from a first website to a second website. If a user views supplemental content form a second website on a first website, but visits the second website without clicking on the link within the supplemental content, the second website's analytics engine is unaware the supplemental content was effective in driving traffic to the second website.

BRIEF SUMMARY OF THE DISCLOSURE

According to one aspect of the disclosure a method for matching content viewing with data analytics includes receiving a first data packet responsive to the viewing, by a first computing device, of a content item on a first web page and storing the first data packet in association with a content item identifier in a first database. The method may also include receiving a second data packet responsive to the first computing device accessing a second web page and storing the second data packet in association an identification of with the second web page in a second database. The method may also include determining, responsive to an identification of a shared unique identifier between the first and second data packet, that the first computing device viewed the first web page prior to viewing the second web page, and then matching a page visit of the second web page by the first computing device to the viewing of the content item by the first computing device.

In some implementations, the first data packet includes a first cookie ID and the second data packet includes a second cookie ID. In some of these implementations, the first data packet is further stored in association with at least one of a campaign, an advertiser name, a content type, and a content item name.

In other implementations, the method also includes receiving a third data packet responsive to the viewing, by a third computing device, of a second content item, on a third web page and determining if the third data packet shares a unique identifier with the second data packet. In certain implementations, the method further includes matching a second page visit of the second website by the first computing device to the viewing of a second content item by the first computing device.

In certain implementations, the method includes calculating an effective measure of the content item by determining if the first database contains an additional data packet with the same unique identifier as the second data packet. In yet other implementations, an effective measure of a campaign or a content type associated with the content item is calculated.

According to another aspect of the disclosure, a system for matching content viewing with data analytics includes one or more processors and a computer-readable storage medium storing instructions that when executed by the one or more processors cause the one or more processors to perform operations. The operations can include receiving a first data packet responsive to the viewing, by a first computing device, of a content item on a first web page, and storing the first data packet in association with a content item identifier in a first database. The operations can also include

receiving a second data packet responsive to the first computing device accessing a second web page, and storing the second data packet in association an identification of with the second web page in a second database. The operations can further include determining, responsive to an identification of a shared unique identifier between the first and second data packet, that the first computing device viewed the first web page prior to viewing the second web page; and matching a page visit of the second web page by the first computing device to the viewing of the content item by the first computing device.

In some implementations, the first data packet comprises a first cookie ID and the second data packet comprises a second cookie ID. In yet other implementations, the instructions further cause the one or more processors to perform the operation of storing the first data packet in association with at least one of a campaign, an advertiser name, a content type, and a content item name. In other implementations, the instructions further cause the one or more processors to perform the operation of receiving a third data packet responsive to the viewing, by a third computing device, of a second content item, on a third web page.

In certain implementations, the instructions further cause the one or more processors to perform the operation of determining if the third data packet shares a unique identifier with the second data packet, and perform the operation of matching a second page visit of the second website by the first computing device to the viewing of a second content item by the first computing device.

In yet other implementations, the instructions further cause the one or more processors to perform the operation of calculating an effective measure of the content item, wherein the effective measure further includes determining if the first database contains an additional data packet with the same unique identifier as the second data packet. In some implementations, the instructions further cause the one or more processors to perform the operation of calculating an effective measure of a campaign or a content type associated with the content item.

According to another aspect of the disclosure, a computer readable medium having instructions stored thereon, which when executed by at least one processing circuit, cause the at least one processing circuit to match content viewing with data analytics. The computer readable medium includes instructions to receive a first data packet responsive to the viewing, by a first computing device, of a content item on a first web page, and store the first data packet in association with a content item identifier in a first database. The computer readable medium also includes instructions to receive a second data packet responsive to the first computing device accessing a second web page, and store the second data packet in association an identification of with the second web page in a second database. The computer readable medium further includes instructions to determine, responsive to an identification of a shared unique identifier between the first and second data packet, that the first computing device viewed the first web page prior to viewing the second web page; and match a page visit of the second web page by the first computing device to the viewing of the content item by the first computing device.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects, features, and advantages of the disclosure will become more apparent and

better understood by referring to the following description taken in conjunction with the accompanying drawings, in which:

FIG. **1** is block diagram of an example system for matching content viewing with data analytics; in accordance with an implementation of the present disclosure;

FIG. **2** is a flow diagram of an example method for matching the viewing of a content item with data analytics; in accordance with an implementation of the present disclosure;

FIG. **3** is a flow diagram of an example method of determining the effectiveness of a supplemental content campaign; in accordance with an implementation of the present disclosure;

FIG. **4** is a block diagram illustrating a general architecture for a computer system that may be employed to implement various elements of the system shown in FIG. **1** and the methods shown in FIGS. **2** and **3**; in accordance with an implementation of the present disclosure.

DETAILED DESCRIPTION

The present disclosure is directed generally to systems and methods for the server side matching of web analytics and content viewing. According to the methods and systems disclosed herein, a first identifier is delivered to a client device when the client device accesses a first website. If the client device later accesses a second website the first identifier can be processed by the system to determine if the client device previously accessed the first website.

FIG. **1** is a block diagram of an example system **100** for server side matching of web analytics and supplemental content item viewing. The system **100** includes a plurality of online property servers **110**. The plurality of online property servers **110** provide at least one web page **112** to at least one client device **102** and can also include a cookie database **111**. The system **100** also includes a supplemental content server **120**, which includes a supplemental content database **121** and a cookie database **111**. The supplemental content server **120** can provide supplemental content to client devices **102** responsive to the client device's **120** request when rendering a web page **112**. The supplemental content publisher server **130** provides at least one web page **112** to a client device **102** and also includes a cookie database **111**. The supplemental content publisher server **130** provides the supplemental content server **120** with supplemental content for distribution. The system **100** includes an analytics engine **140**. The analytics engine **140** includes a plurality of sub-components, which inducing a matching module **141**, a collector module **142**, an analysis module **143**, graphical user interface module **144**, a first identifier database **145** and a second identifier database **146**, and an analysis database **147**. As illustrated in system **100**, the various nodes of system **100** communicate with one another via the network **104**.

Referring to system **100** in greater detail, the online property servers **110** and supplemental content publisher servers **130** host web pages **112** that can be accessed and viewed by users over the network **104** via a program running on a client device **102**. The program, such as a web browser, facilitates the sending and receiving of data between the client device **102** and online property server **110**, supplemental content publisher server **130**, and/or supplemental content server **120**. The web pages **112** hosted by the online property servers **110** and supplemental content publisher servers **130** can include, but are not limited to, websites, social media sites, business outlets, or any other network accessible property.

A client device **102** can download a web page **112** from an online property server **110** and execute code contained within the web page **112** to render the web page **112**. The rendered web page **112** can include content such as articles, documents, digital media, or any other network accessible content. Additionally, the rendered web pages **112** can include space for the display of supplemental content. The supplemental content can include, but is not limited to, supplemental information, links to related content, and advertisements.

The plurality of online property servers **110** also include a cookie database **111**. In some implementations, when a web page **112** is accessed by a client device **102**, the web page **112** includes code, which when executed, sets a HTTP cookie (also referred to simply as a cookie) on the client device **102**. In some implementations, the cookie can be generated by the execution of the code and in some implementations the code causes the client device **102** to retrieve data that becomes or is incorporated into the cookie. In some implementations, the data of a cookie stored on a client device **102** can be read and/or amended by the other components of system **100**. When a cookie and a web page **112** originate from the same source, the cookie can be referred to as a first-party cookie. In contrast, a third-party cookie is a cookie that is delivered to a client device **102** from a source that did not provide the web page **112**. For example, a third-party cookie can be generated when an online property server **110** web page **112** contains a script that when executed sets a cookie from the supplemental content server **120**. While the cookie databases **111** of the various components of system **100** are illustrated as a sub-component of each respective component, in some implementations, the cookie database **111** can be maintained on a third party server, such as on the server of a web page analytics system.

In certain implementations, a supplemental content publisher server **130** drives traffic to its own web pages **112** with the placement of supplemental content on the web pages **112** of the online property servers **110**. For example, the supplemental content publisher server **130** can provide a supplemental content item to a supplemental content server **120** which distributes the supplemental content item to a client device **102** when the client device **102** accesses the online property publisher's web page **112**. The supplemental content item may contain a link that when clicked, causes the client device **102** to access a web page **112** of the supplemental content publisher server **130**.

As described above, the supplemental content publisher server **130** can provide supplemental content to a supplemental content server **120**, which in turn distributes the supplemental content to a client device **102** via a web page **112** when requested. In certain implementations, the supplemental content server **120** can be an ad server.

In some implementations, the supplemental content server **120** may provide the online property server **110** with code, that when executed by a client device **102**, sends a request to the supplemental content server **120** for a supplemental content item. The program for viewing the web page **112** on the client device **102** then renders the supplemental content item into the rendered web page **112**. As illustrated, the supplemental content server **120** also includes a cookie database **111**. In some implementations, the cookie database **111** of the supplemental content server **120** can be referred to as a third-party cookie database. It may be referred to as a third party cookie database **111** because in some implementations the supplemental content server **120** sets a cookie on the client device **102** when the code being executed on the client device **102** requests a supplemental

content item. In certain implementations, the code provided by the supplemental content server **120** also transmits back anonymous information to the supplemental content server **120**. In some implementations, the transmitted data and/or the cookie can be used to ensure the same supplemental content item is not delivered to a client device **102** multiple times. In some implementations, the transmitted data can be data from cookies previously delivered to the client device **102** by the supplemental content server **120**.

For situations in which the systems discussed here collect personal information about users, or may make use of personal information, the users may be provided with an opportunity to control whether programs or features that may collect personal information (e.g., information about a user's social network, social actions or activities, a user's preferences, or a user's current location), or to control whether or how to receive content from the content server that may be more relevant to the user. In addition, certain data may be anonymized in one or more ways before it is stored or used, so that personally identifiable information is removed when generating parameters (e.g., demographic parameters). For example, a user's identity may be anonymized so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over how information is collected about him or her and used by a content server.

The system **100** also includes an analytics engine **140**. As illustrated, the analytics engine **140** is a stand alone component that communicates with the other components of the system **100** via the network **104**. In other implementations, the analytics engine **140** can be a component of the supplemental content server **120** or the above-referenced third-party analytics system.

In order to match the previous viewing of supplemental content with access to a supplemental content publisher server's web page **112**, the collector module **142** of the analytics engine **140** can retrieve anonymous data from the cookie database **111** of the online property publisher, the supplemental content server, and/or the supplemental content publisher server in order to link the site visit of a web page **112** to the viewing of supplemental content on another web page. For example, a user may view supplemental content for a music website on a news site, but does not click on the supplemental content. Rather, at a later date, the user visits the music website by directly entering the music website's URL into a web browser executing on user's client device **102**. In this example, by analyzing the retrieved cookies from the various servers of system **100**, the analytics engine **140** can match the visit to the music website with previously-viewed supplemental content on the news website.

In some implementations, cookies retrieved from the cookie database **111** of the supplemental content server **120** or online property sever **110** are referred to as first identifiers and the cookies retrieved from the cookie database **111** of the supplemental content publisher server **130** are referred to as second identifiers. In some implementations, the collector module **142** stores the retrieved first identifier cookie data in the first identifier database **145** and stores the retrieved second identifier cookie in the second identifier database **146**. In other implementations, the first and second identifiers are stored into a unified cookie database of the analytics engine **140**.

The analytics engine **140** also includes a matching module **141**. Discussed further in relation to the method **200** of FIG. **2**, but briefly, the matching module **141** matches the second identifiers to first identifiers. Responsive to this step, the analytics engine **140** can determine if the viewing of a supplemental content item later resulted in a page visit.

In some implementations, the analytics engine **140** includes an analysis module **142**. The analysis module **142** is used to provide a supplemental content publisher server **130** with information regarding the effectiveness of supplemental content. Discussed further in relation to method **300** of FIG. **3**, but briefly, the analysis module **142** may show a supplemental content publisher server **130** the percentage of supplemental content views that translate into website traffic for the supplemental content publisher server **130**. In certain implementations, a grouping of supplemental content items deployed by a supplemental content publisher server **130** is called a supplemental content campaign. The analytics engine **140** can store the analysis in the analysis database **147** for later retrieval and/or display.

The analytics engine **140** also includes a graphical user interface (GUI) **144**. The GUI **144** can be used by the supplemental content publisher server **130** to view and/or request to view the above described analysis. Access to the GUI **144** may be secured using passwords, encryption, security keys, or other security measures. The GUI **144** may be a web page or the GUI of a mobile device or computer application.

FIG. **2** is a flow chart of an example method **200** for matching a page visit with the previous viewing of supplemental content using the system **100**. The method **200** includes receiving a first identifier from a first device (step **201**) and storing the first identifier in association with a content item (step **202**). The method **200** also includes receiving a second identifier from a second computing device (step **203**) and storing the second identifier in association with an online property. Responsive to receiving the first identifier and the second identifier, the system determines if the identifiers match (step **204**). Next, the system matches the viewing of the content item to a page visit responsive to the determination of the identifiers match (step **206**).

As set forth above, the method **200** begins with the receipt of a first identifier from a first computing device (step **201**). In some implementations, the first identifier is data within a HTTP cookie. As described above, the cookie can be provided to a client device **102** when the client device **102** executes code from a web page **112**, and similar code within a web page **112** can be used to retrieve data from a set HTTP cookie. For example, the first identifier can be set when the client device **102** executes code from a web page **112** that retrieves a supplemental content item. In some implementations, the collector module **142** of the analytics engine **140** retrieves the first identifiers at regular intervals. For example, the collector module **142** may collect the first identifiers once an hour, once a day, or once a week. In other implementations, the first identifier is transmitted to the analytics engine **140** immediately after being created

Next, the method **200** stores the first identifier in association with a content item (step **202**). As discussed above, the first identifier is set responsive to a client device **102** retrieving a supplemental content item. In some implementations, the supplemental content item that was delivered to the client device **102** also includes an identifier. In some implementations, the supplemental content identifier uniquely identifies the supplemental content item, the publisher of the supplemental content item, and/or the campaign

to which the supplemental content item belongs. In some implementations, storing the first identifier in association with the supplemental content identifier allows for subsequent page visits to be matched to the viewing of a supplemental content item. For example, a user may view a website that includes an advertisement for a book. Upon the delivery of the advertisement to the client device 102, the supplemental content server 120 can provide the client device 102 with a random number that is stored in a HTTP cookie set on the client device 102. This random number can be transmitted to the analytics engine 140 as the first identifier. Additionally, in this example, the ad may be given a unique identifier by the supplemental content server 120, which can also be transmitted to the analytics engine 140. The analytics engine 140 may store additional information with the first identifier, such as the date and time the first identifier was created by the supplemental content server 120.

The method 200 also includes receiving a second identifier (step 203). In some implementations, the second identifier is a first-party cookie set when a client device 102 accesses a web page 112. In certain implementations, the second identifier is transmitted to the analytics engine 140 in association with an online property server identifier or a supplemental content publisher server identifier. In certain implementations, the second identifier can include additional data associated with the first identifier. For example, a client device 102 may access a website that sets a second identifier. In setting the second identifier, data from the first identifier may be retrieved from the client device 102. The code setting the second identifier may then communicate the details of a first identifier to the analytics engine 140 when reporting the second identifier. For example, a user may visit a website which contains supplemental content. When retrieving the supplemental content to display to the user, the code retrieving the supplemental content may set a first identifier. At a later date, the user may visit a second website, which is a website of the supplemental content publisher server that published the supplemental content previously viewed by the user. Code on the second website may set a second identifier, which also retrieves any first identifier stored on the client 102 that was set by supplemental content retrieval code provided to the first website by the supplemental content publisher server 130.

Responsive to receiving the second identifier, the method 200 includes storing the second identifier in association with the online property from which it originated (step 204). As discussed above, in some implementations, the website from which the second identifier is received is a website of the supplemental content publisher server 130. The second identifier is stored in association with the originating supplemental content publisher server 130, such that at subsequent steps, the origin of the second identifier can be referenced. In some implementations, the second identifier is also stored in association with details such as, but not limited to, the data the second identifier was created by the originating website, the time the second identifier was created by the originating website, and/or a first identifier.

The method 200 continues with the determination if the first and second identifiers match (step 205). In some implementations, after the collector module 142 has collected and stored the first and second identifiers, the matching module 141 cycles through the second identifiers in the second identifier database 146 to determine if there is a matching first identifier in the first identifier database 145. In some implementations, the matching module 141 can find a plurality of first identifiers that match to a single second identifier. For example, a client device 102 may access a

plurality of websites each containing supplemental content from the same supplemental content publisher server 130. In this example, each visit to a website with the supplemental content publisher server's supplemental content will generate a first identifier. Upon visiting the web page 112 of the supplemental content publisher server 130, a second identifier is created, and because each of the first identifiers in this example were created by the same supplemental content publisher server 130, each first identifier can be determined to match the second identifier. In some implementations, the matches found by the matching module 141 are stored in the analysis database 147. In some implementations, the matching module repeats the matching process on a regular interval, such as every day, every week, or every month. In some implementations, the repeat of the matching process can include up to 90 days of page first identifier. For example, a user may visit a website A on day 1 and view an advertisement for website B, for which the user does not visit on day 1. Because the user did not visit website B on day 1, the matching module will not find a match for the first identifier generated from the viewing of website A on day 1. If, in this example, the user visits website B on day 4, the matching module will find a match for the first identifier generated on day 1 in the second identifier generated on day 4 responsive to visiting website B. In certain implementations, after matching a first identifier to a second identifier, the matching module can check at a later date to determine if a better and/or additional matches to the second identifier have been retrieved by the analysis engine 140.

The method 200 concludes with the matching of a page visit to the viewing of the supplemental content item (step 206). As discussed above, multiple first identifier matches can be found for a second identifier. In some implementations, the duplicate matches from step 205 are combined or deleted such that only one match is recorded for each second identifier. In some implementations, a second identifier is matched with the first identifier that was created in the most recent history. For example, and continuing the above example of visits to website A and website B, if the user, after visiting website B for the first time, returns to website A on day 5 and then visits website B a second time on day 6, the matching module may match the visit of website B on day 6 to the visit of website A on days 5 and 1 and match the visit of website B on day 4 to the visit of website A on day 1. During the matching step 206, the visit of website A on day 1 is matched to the page visit of website B on day 4 and the visit of website A on day 5 is matched to the visit of website B on day 6. In some implementations, the match of a page visit to the viewing of a content item is stored in the analysis database 147.

FIG. 3 is a flow chart of an example method 300 for analyzing the effectiveness of a supplemental content campaign. The method 300 beings with receiving a request to determine the effectiveness of a campaign (step 301). Responsive to the request data is retrieved from the analysis database (step 302). Having retrieved the data, the data is analyzed (step 303).

As set forth above, the method 300 of analyzing the effectiveness of a supplemental content campaign begins with the receipt of a request to determine the effectiveness of a campaign (step 301). The request can be atomically generated as part of a reporting system and/or the request can be initiated by the owner of an online property server 110 or supplemental content publisher server 130. In some implementations, the plurality of requests are continually generated and executed, such that the owner of the supplemental content publisher server 130 can log into the ana-

lytics engine **140** via the GUI **144** and view the effectiveness of the campaigns the supplemental content publisher server **130** is currently running.

The method **300** also includes retrieving data from the analysis database (step **302**). As discussed above, the analysis database can contain all the pairings of first identifiers to second identifiers. In some implementations, the pairings have not yet been stored in the analysis database and the retrieval step **302** can include steps similar to the steps of method **200** to generate the data.

Responsive to retrieving the data, the effectiveness of the campaign is analyzed (step **303**). When a supplemental content publisher server **130** has supplemental content placed on the web page **112** of an online property server **110**, it is typically to drive traffic to the web pages **112** of the supplemental content publisher server **130**. In some implementations, the effectiveness of the supplemental content is based on the rate of supplemental content click throughs vs. the rate of supplemental content view throughs. Clicking on a supplemental content item by a user of a client device **102** may take the user device **102** directly to the web page **112** of a supplemental content publisher server **130**. This action is called a click through. A view through occurs when the user views, but does not click on, a supplemental content item and then travels to the supplemental content publisher server **130** at a later date. A supplemental content campaign may be determined effective when supplemental content items that convert to view through and click through is above a predetermined percent of the total supplemental content items displayed.

Similarly, in some implementations, the effectiveness of a supplemental content campaign can be determined by analyzing what faction of the displayed supplemental content items contribute to site traffic of the web pages **112** of the supplemental content publisher server **130**. In this example, the above-described view throughs and click throughs are combined to create a single effectiveness metric. For example, a tennis shoe company may have 1 million ads displayed to a plurality of client devices **102** via a plurality web pages **112** of online property servers **110**. If those 1 million ads result in 75,000 click throughs and 150,000 view throughs, the total effectiveness may be 22.5%, with a 15% view through rate and a 7.5% click through rate.

In another example, the effectiveness of a supplemental content campaign may be determined by how many times a supplemental content item is viewed before an action is taken by a user. In some implementations, this is calculated by comparing the number of first identifiers associated with a second identifier. For example, if for a specific campaign, the average ratio of first identifiers to second identifiers is 2 to 1, then on average, a user is shown 2 supplemental content items before the user visits the web page **112** of the supplemental content publisher server **130**. A campaign with a ratio of 5 to 1 would be less effective because, on average, a user needs to be shown five supplemental content items before visiting the web page **112** of the supplemental content publisher server **130**. In some implementations, the action can include accessing the webpage **112** of a supplemental content publisher server **130**, purchasing a product, signing up for an account, and/or clicking on a link in a web page **112**.

FIG. **4** is a block diagram of a computer system **400** in accordance with an illustrative implementation. The computer system or computing device **400** can be used to implement the system **100**, client device **102**, online property publisher **110**, supplemental content publisher server **130**, supplemental content server **120**, and the analytics

engine **140**. The computing system **400** includes a bus **405** or other communication component for communicating information and a processor **410** or processing circuit coupled to the bus **405** for processing information. The computing system **400** can also include one or more processors **410** or processing circuits coupled to the bus for processing information. The computing system **400** also includes main memory **415**, such as a random access memory (RAM) or other dynamic storage device, coupled to the bus **405** for storing information, and instructions to be executed by the processor **410**. Main memory **415** can also be used for storing position information, temporary variables, or other intermediate information during execution of instructions by the processor **410**. The computing system **400** may further include a read only memory (ROM) **420** or other static storage device coupled to the bus **405** for storing static information and instructions for the processor **410**. A storage device **425**, such as a solid state device, magnetic disk or optical disk, is coupled to the bus **405** for persistently storing information and instructions.

The computing system **400** may be coupled via the bus **405** to a display **435**, such as a liquid crystal display, or active matrix display, for displaying information to a user. An input device **430**, such as a keyboard including alphanumeric and other keys, may be coupled to the bus **405** for communicating information and command selections to the processor **410**. In another implementation, the input device **430** has a touch screen display **435**. The input device **430** can include a cursor control, such as a mouse, a trackball, or cursor direction keys, for communicating direction information and command selections to the processor **410** and for controlling cursor movement on the display **435**.

According to various implementations, the processes described herein can be implemented by the computing system **400** in response to the processor **410** executing an arrangement of instructions contained in main memory **415**. Such instructions can be read into main memory **415** from another computer-readable medium, such as the storage device **425**. Execution of the arrangement of instructions contained in main memory **415** causes the computing system **400** to perform the illustrative processes described herein. One or more processors in a multi-processing arrangement may also be employed to execute the instructions contained in main memory **415**. In alternative implementations, hard-wired circuitry may be used in place of or in combination with software instructions to effect illustrative implementations. Thus, implementations are not limited to any specific combination of hardware circuitry and software.

Although an example computing system has been described in FIG. **4**, implementations of the subject matter and the functional operations described in this specification can be implemented in other types of digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them.

Implementations of the subject matter and the operations described in this specification can be implemented in digital electronic circuitry, or in computer software, firmware, or hardware, including the structures disclosed in this specification and their structural equivalents, or in combinations of one or more of them. The subject matter described in this specification can be implemented as one or more computer programs, i.e., one or more circuits of computer program instructions, encoded on one or more computer storage media for execution by, or to control the operation of, data processing apparatus. Alternatively or in addition, the pro-

gram instructions can be encoded on an artificially generated propagated signal, e.g., a machine-generated electrical, optical, or electromagnetic signal that is generated to encode information for transmission to suitable receiver apparatus for execution by a data processing apparatus. A computer storage medium can be, or be included in, a computer-readable storage device, a computer-readable storage substrate, a random or serial access memory array or device, or a combination of one or more of them. Moreover, while a computer storage medium is not a propagated signal, a computer storage medium can be a source or destination of computer program instructions encoded in an artificially generated propagated signal. The computer storage medium can also be, or be included in, one or more separate components or media (e.g., multiple CDs, disks, or other storage devices).

The operations described in this specification can be performed by a data processing apparatus on data stored on one or more computer-readable storage devices or received from other sources.

The term "data processing apparatus" or "computing device" encompasses various apparatuses, devices, and machines for processing data, including by way of example a programmable processor, a computer, a system on a chip, or multiple ones, or combinations of the foregoing. The apparatus can include special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit). The apparatus can also include, in addition to hardware, code that creates an execution environment for the computer program in question, e.g., code that constitutes processor firmware, a protocol stack, a database management system, an operating system, a cross-platform runtime environment, a virtual machine, or a combination of one or more of them. The apparatus and execution environment can realize various different computing model infrastructures, such as web services, distributed computing and grid computing infrastructures.

A computer program (also known as a program, software, software application, script, or code) can be written in any form of programming language, including compiled or interpreted languages, declarative or procedural languages, and it can be deployed in any form, including as a stand alone program or as a circuit, component, subroutine, object, or other unit suitable for use in a computing environment. A computer program may, but need not, correspond to a file in a file system. A program can be stored in a portion of a file that holds other programs or data (e.g., one or more scripts stored in a markup language document), in a single file dedicated to the program in question, or in multiple coordinated files (e.g., files that store one or more circuits, sub programs, or portions of code). A computer program can be deployed to be executed on one computer or on multiple computers that are located at one site or distributed across multiple sites and interconnected by a communication network.

Processors suitable for the execution of a computer program include, by way of example, both general and special purpose microprocessors, and any one or more processors of any kind of digital computer. Generally, a processor will receive instructions and data from a read only memory or a random access memory or both. The essential elements of a computer are a processor for performing actions in accordance with instructions and one or more memory devices for storing instructions and data. Generally, a computer will also include, or be operatively coupled to receive data from or transfer data to, or both, one or more mass storage devices for storing data, e.g., magnetic, magneto optical disks, or

optical disks. However, a computer need not have such devices. Moreover, a computer can be embedded in another device, e.g., a mobile telephone, a personal digital assistant (PDA), a mobile audio or video player, a game console, a Global Positioning System (GPS) receiver, or a portable storage device (e.g., a universal serial bus (USB) flash drive), to name just a few. Devices suitable for storing computer program instructions and data include all forms of non volatile memory, media and memory devices, including by way of example semiconductor memory devices, e.g., EPROM, EEPROM, and flash memory devices; magnetic disks, e.g., internal hard disks or removable disks; magneto optical disks; and CD ROM and DVD-ROM disks. The processor and the memory can be supplemented by, or incorporated in, special purpose logic circuitry.

To provide for interaction with a user, implementations of the subject matter described in this specification can be implemented on a computer having a display device, e.g., a CRT (cathode ray tube) or LCD (liquid crystal display) monitor, for displaying information to the user and a keyboard and a pointing device, e.g., a mouse or a trackball, by which the user can provide input to the computer. Other kinds of devices can be used to provide for interaction with a user as well; for example, feedback provided to the user can be any form of sensory feedback, e.g., visual feedback, auditory feedback, or tactile feedback; and input from the user can be received in any form, including acoustic, speech, or tactile input.

While this specification contains many specific implementation details, these should not be construed as limitations on the scope of any inventions or of what may be claimed, but rather as descriptions of features specific to particular implementations of particular inventions. Certain features described in this specification in the context of separate implementations can also be implemented in combination in a single implementation. Conversely, various features described in the context of a single implementation can also be implemented in multiple implementations separately or in any suitable subcombination. Moreover, although features may be described above as acting in certain combinations and even initially claimed as such, one or more features from a claimed combination can in some cases be excised from the combination, and the claimed combination may be directed to a subcombination or variation of a subcombination.

Similarly, while operations are depicted in the drawings in a particular order, this should not be understood as requiring that such operations be performed in the particular order shown or in sequential order, or that all illustrated operations be performed, to achieve desirable results. In certain circumstances, multitasking and parallel processing may be advantageous. Moreover, the separation of various system components in the implementations described above should not be understood as requiring such separation in all implementations, and it should be understood that the described program components and systems can generally be integrated in a single software product or packaged into multiple software products.

References to "or" may be construed as inclusive so that any terms described using "or" may indicate any of a single, more than one, and all of the described terms.

Thus, particular implementations of the subject matter have been described. Other implementations are within the scope of the following claims. In some cases, the actions recited in the claims can be performed in a different order and still achieve desirable results. In addition, the processes depicted in the accompanying figures do not necessarily

require the particular order shown, or sequential order, to achieve desirable results. In certain implementations, multitasking and parallel processing may be advantageous.

What is claimed:

1. A method for matching content viewing with data analytics for a content provider, the method comprising:

receiving a plurality of first data packets, each first data packet received responsive to a viewing, by a first computing device, of a content item on a first web page, the first web page provided by a third party different from the content provider, each first data packet including a content item identifier associated with the content item and first time data indicating a first time at which the content item was viewed;

storing the first data packets in a first database;

receiving a plurality of second data packets, each second data packet received responsive to the first computing device accessing a second web page provided by the content provider, each second data packet including a web page identifier associated with the second web page and second time data indicating a second time at which the second web page was accessed;

storing the second data packets in a second database;

for each of the second data packets:

determining whether there is a content item identifier of a first data packet in the first database matching a web page identifier of the second data packet;

responsive to determining there is the content item identifier of the first data packet in the first database matching the web page identifier of the second data packet, determining whether the first time of the first data packet is prior to the second time of the second data packet;

determining whether the second web page is accessed by clicking through the content item based on the first data packet and the second packet;

responsive to determining the first time is prior to the second time and the second web page is not accessed by clicking through the content item, determining that the content item was viewed within the first web page on the first computing device prior to accessing the second web page and matching the accessing of the second web page by the first computing device to the viewing of the content item on the first computing device without clicking though the content item; and

responsive to determining the first time is prior to the second time and the second web page is accessed by clicking through the content item, determining that the first computing device accessed the second web page after the content item was clicked through on the first web page;

determining an amount of times the second web page is accessed after viewing of the content item without clicking through the content item relative to a total amount of times the content item is displayed;

determining an amount of times the second web page is accessed after clicking through the content item relative to the total amount of times the content item is displayed; and

calculating an effectiveness measure of the content item, the effectiveness measure based on at least one of:

the amount of times the second web page is accessed after viewing of the content item relative to the total amount of times the content item is displayed;

the amount of times the second web page is accessed by clicking through the content item relative to the total amount of times the content item is displayed; or

an average number of times the content item is viewed before the second web page is accessed.

2. The method of claim 1, wherein each first data packet comprises a first cookie ID and each second data packet comprises a second cookie ID.

3. The method of claim 1, wherein each first data packet is further stored in association with at least one of a campaign, an advertiser name, a content type, and a content item name.

4. The method of claim 1, further comprising receiving a plurality of third data packets responsive to the viewing, by a third computing device, of a second content item, on a third web page.

5. The method of claim 4, further comprising determining if each third data packet shares a unique identifier with at least one of the second data packets.

6. The method of claim 5, further comprising matching a second page visit of the second website by the first computing device to the viewing of a second content item by the first computing device.

7. The method of claim 1, wherein calculating the effectiveness measure further comprises determining, for each second data packet, if the first database contains an additional data packet with an identifier that matches the web page identifier of the second data packet.

8. The method of claim 1, further comprising calculating an effectiveness measure of a campaign or a content type associated with the content item using the effectiveness measure of the content item.

9. The method of claim 1, wherein the content item is an advertisement.

10. A system for matching content viewing with data analytics, the system comprising:

one or more processors;

a computer-readable storage medium storing instructions that when executed by the one or more processors cause the one or more processors to perform operations comprising:

receiving a plurality of first data packets, each first data packet received responsive to a viewing, by a first computing device, of a content item on a first web page, the first web page provided by a third party different from the content provider, each first data packet including a content item identifier associated with the content item and first time data indicating a first time at which the content item was viewed;

storing the first data packets in a first database;

receiving a plurality of second data packets, each second data packet received responsive to the first computing device accessing a second web page provided by the content provider, each second data packet including a web page identifier associated with the second web page and second time data indicating a second time at which the second web page was accessed;

storing the second data packets in a second database;

for each of the second data packets:

determining whether there is a content item identifier of a first data packet in the first database matching a web page identifier of the second data packet;

responsive to determining there is the content item identifier of the first data packet in the first database matching the web page identifier of the second data

packet, determining whether the first time of the first data packet is prior to the second time of the second data packet;

determining whether the second web page is accessed by clicking through the content item based on the first data packet and the second packet;

responsive to determining the first time is prior to the second time and the second web page is not accessed by clicking through the content item, determining that the content item was viewed within the first web page on the first computing device prior to accessing the second web page and matching the accessing of the second web page by the first computing device to the viewing of the content item on the first computing device without clicking though the content item; and

responsive to determining the first time is prior to the second time and the second web page is accessed by clicking through the content item, determining that the first computing device accessed the second web page after the content item was clicked through on the first web page;

determining an amount of times the second web page is accessed after viewing of the content item without clicking through the content item relative to a total amount of times the content item is displayed;

determining an amount of times the second web page is accessed after clicking through the content item relative to the total amount of times the content item is displayed; and

calculating an effectiveness measure of the content item, the effectiveness measure based on at least one of:

the amount of times the second web page is accessed after viewing of the content item relative to the total amount of times the content item is displayed;

the amount of times the second web page is accessed by clicking through the content item relative to the total amount of times the content item is displayed; or

an average number of times the content item is viewed before the second web page is accessed.

11. The system of claim **10**, wherein each first data packet comprises a first cookie ID and each second data packet comprises a second cookie ID.

12. The system of claim **10**, wherein the instructions further cause the one or more processors to perform the operation of storing each first data packet in association with at least one of a campaign, an advertiser name, a content type, and a content item name.

13. The system of claim **10**, wherein the instructions further cause the one or more processors to perform the operation of receiving a plurality of third data packets responsive to the viewing, by a third computing device, of a second content item, on a third web page.

14. The system of claim **13**, wherein the instructions further cause the one or more processors to perform the operation of determining if each third data packet shares a unique identifier with at least one of the second data packets.

15. The system of claim **14**, wherein the instructions further cause the one or more processors to perform the operation of matching a second page visit of the second web site by the first computing device to the viewing of a second content item by the first computing device.

16. The system of claim **10**, calculating the effectiveness effective measure further comprises determining, for each second data packet, if the first database contains an additional data packet with an identifier that matches the web page identifier of the second data packet.

17. The system of claim **10**, wherein the instructions further cause the one or more processors to perform the operation of calculating an effectiveness measure of at least one a supplemental content campaign or a supplemental content type associated with the content item using the effectiveness measure of the content item.

18. The system of claim **10**, wherein the content item is an advertisement.

19. A non-transitory computer readable medium having instructions stored thereon, which when executed by at least one processing circuit, cause the at least one processing circuit to:

receiving a plurality of first data packets, each first data packet received responsive to a viewing, by a first computing device, of a content item on a first web page, the first web page provided by a third party different from the content provider, each first data packet including a content item identifier associated with the content item and first time data indicating a first time at which the content item was viewed;

storing the first data packets in a first database;

receiving a plurality of second data packets, each second data packet received responsive to the first computing device accessing a second web page provided by the content provider, each second data packet including a web page identifier associated with the second web page and second time data indicating a second time at which the second web page was accessed;

storing the second data packets in a second database;

for each of the second data packets:

determining whether there is a content item identifier of a first data packet in the first database matching a web page identifier of the second data packet;

responsive to determining there is the content item identifier of the first data packet in the first database matching the web page identifier of the second data packet, determining whether the first time of the first data packet is prior to the second time of the second data packet;

determining whether the second web page is accessed by clicking through the content item based on the first data packet and the second packet;

responsive to determining the first time is prior to the second time and the second web page is not accessed by clicking through the content item, determining that the content item was viewed within the first web page on the first computing device prior to accessing the second web page and matching the accessing of the second web page by the first computing device to the viewing of the content item on the first computing device without clicking though the content item; and

responsive to determining the first time is prior to the second time and the second web page is accessed by clicking through the content item, determining that the first computing device accessed the second web page after the content item was clicked through on the first web page;

determining an amount of times the second web page is accessed after viewing of the content item without clicking through the content item relative to a total amount of times the content item is displayed;

determining an amount of times the second web page is accessed after clicking through the content item relative to the total amount of times the content item is displayed; and

calculating an effectiveness measure of the content item,
the effectiveness measure based on at least one of:
the amount of times the second web page is accessed
after viewing of the content item relative to the total
amount of times the content item is displayed;
the amount of times the second web page is accessed by
clicking through the content item relative to the total
amount of times the content item is displayed; or
an average number of times the content item is viewed
before the second web page is accessed.

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